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General Guidelines and Strategies for Vaccine Use in Cats and Dogs

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General Guidelines and Strategies for Vaccine Use in Cats and Dogs

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Vaccinations have greatly contributed to the well-being of our companion animals. The number of patients we see with infectious diseases has decreased significantly over the past 20 years, ever since the first vaccines were available. Many of the infectious diseases are ubiquitous and are often fatal in the unvaccinated animal. Thus, the importance of vaccinations cannot be overstated. However, differences in risk of exposure to infectious diseases, age and health of the patient, and potential side effects of certain vaccines make it next to impossible to recommend one single vaccination protocol for all cats or for all dogs. Therefore, we recommend for optimal protection that each animal be examined on a yearly basis even if vaccines are not to be given in that particular year. Health and lifestyle changes can be assessed, and the animal's vaccination protocol can be adjusted if needed.

Cats

Only healthy cats should be vaccinated. For example, if an animal is presented with a body temperature that is elevated and remains above 103°F on repeated measurements, its cellular immune system shuts down. Thus, the vaccine may not be efficacious or worse, may cause disease. Animals with immunodeficiencies or receiving chemotherapy also will not respond appropriately to vaccination. For these animals, it may be beneficial to use killed vaccines to which many are still able to respond (i.e., mount an immune response), yet the risk of causing infection as with modified live vaccines is virtually absent.

Dogs

Clients may not bring their dogs to their veterinarians if vaccines are only given every three years or if they are worried that the immunity will last less than three years. However, diseases such as leptospirosis in dogs need to be vaccinated against annually. Titers may also be measured in lieu of yearly DHPP boosters (distemper, hepatitis, parainfluenza, and parvovirus). While it is impractical and expensive to determine titers against every triennially vaccinated disease, in-house kits are now available to determine distemper and parvoviral titers in dogs, which may reflect the dog's general immune status.

Issues to Keep in Mind

Vaccination sites should **always** be recorded, in case reactions are seen later. In cats and dogs, rabies vaccines should always be given in the right upper hind limb. In cats, FeLV (feline leukemia) vaccines are given in the left upper hind limb. Other vaccines may be given on the right or left side of the abdomen. We do not recommend giving vaccines between the shoulder blades (or in the tail!) because of the poor drainage of this site.

Pregnancy: It is best to vaccinate before pregnancy. If this is not possible, killed vaccines can and should be used safely two weeks before the expected due date. Two weeks allows sufficient time for the production of antibodies, which can then be passed on to the offspring via colostral intake. However, because of the nature of killed vaccines, adverse, allergic-type reactions are more likely.

Vaccine Reactions: For the first half-hour after vaccination, owners should carefully observe their animal for signs of acute allergic reactions. In our clinic, this is about the time it takes to write up the discharges and have the Business Office prepare the bill. In case of allergic reactions, contact the clinician or the Emergency Service imme-

Canine Vaccination Protocol at the Matthew J. Ryan Veterinary Hospital

	Neonates	Puppy Series			Last Puppy Booster	First Adult Booster	Adult Boosters	
Vaccines	**2-5 weeks**	**6-8 weeks**	**10-12 weeks**	**13-16 weeks**	**16 weeks**	**15 months**	**Every year**	**Every 3 years**
Distemper/Measles	X							
Killed Parvovirus	X							
Distemper		X	X	X	X	X		X
Canine Adenovirus Type 2		X	X	X	X	X		X
Canine								
Parainfluenza		X	X	X	X	X		X
Canine Parvovirus		X	X	X	X	X		X
Rabies Virus				X		X		X
Leptospira (optional)			X	X	X#	X	X	
Bordtella (optional)			X	X	X#	X	X	

*A dog presented before 6 weeks of age that may be lacking colostrum or in case of high infectious disease risk (*) should be given measles virus vaccine to overcome maternal protection against distemper.

#Because of the potential for allergic reactions, we recommend beginning with Leptospirosis and/or killed, injectable Bordetella vaccines 3–4 weeks before the last vaccine of the puppy series is given and then booster together with last of the puppy series.

diately, treat with Benadryl® (diphenhydramine at 2–4 mg/kg TID-QID PO IM or IV) and/or short-term steroids (dexamethasone sodium phosphate for anaphylaxis at 0.25 mg/kg IV or prednisolone tablets for milder reactions at 0.5–1 mg/kg BID PO or IM). Also give the owner medication to take home for the affected animal. In very severe cases, it may be necessary to give epinephrine (0.5–1.5 ml IV of a 1:10,000 solution; repeat in 30 minutes) and life support. If an animal has had a reaction before, depending on the severity, it may be given Benadryl® one half hour before vaccination, may be kept in the clinic for 24 hours for observation, or not vaccinated at all. In cases where the veterinarian and the owner have opted not to vaccinate the animal, titers to the corresponding diseases may be measured, but keep in mind that serum titers do not reflect the actual state of local immunity.

Types of Vaccine Reactions: Vaccine reactions may be divided into different categories of hypersensitivity reactions and other side effects. **Type I** (immediate hypersensitivity) reactions result in allergy or anaphylaxis and are most commonly caused by bacterins, killed rabies, feline leukemia, and feline respiratory viruses. **Type II** (cytotoxicity) reactions may result in either hypersensitivity or autoimmunity, such as autoimmune hemolytic anemia (AIHA) or autoimmune thrombocytopenia (AITP). The most common culprits are the modified live parvoviral (AIHA) and modified live distemper vaccines (AITP), although CAV-1 MLV has also been implicated in causing AITP. **Type III** (immune complex hypersensitivity) reactions are seen in the form of either uveitis after vaccination with CAV-1 MLV or generalized serum sickness after passive immunization. Examples of **Type IV** (cell mediated) reactions are granuloma formation after BCG immunotherapy, encephalitis after vaccination against rabies with vaccines that were derived from nervous tissue, or polyradiculoneuritis after the use of inactivated neonatal mouse brain rabies vaccines.

Other Side Effects: Other side effects of vaccines include local or systemic reactions. Local reactions at the site of injection are usually caused by adjuvants, preservatives, and inactivators found in bacterins and inactivated rabies vaccines. Modified live vaccines are intended to replicate in the lymph nodes mimicking a natural infection, but may lead to fever and general malaise. Any MLV given during pregnancy may lead to abortion in the maternal animal, congenital malformations, clinical signs of disease, or death of the fetus/neonate. For example, giving CPV vaccines to neonates <5 weeks of age may lead to cardiomyopathy and death because the myocytes are still dividing, making them especially vulnerable to the effects of the live parvo vaccine.

Clinical signs of disease may also be seen in vaccinates after incomplete attenuation of the vaccine or local administration of attenuated vaccines (all intranasal vaccines). Postvaccinal encephalitis may result in immunosuppressed or mildly immunosuppressed animals that had received poorly attenuated vaccines and can be caused by distemper, measles, rabies, CAV-1, or canine coronaviral vaccines. Parenteral injection of intranasal vaccines may cause localized swelling, pain, fever, vomiting, mature leukocytosis, hypercholesteremia, hypoalbuminemia, and increases in serum alkaline phosphatase, ALT, and chloride, which all are due to hepatocellular necrosis. Lastly, animals may shed the modified live vaccine virus, possibly infecting an immunocompromised animal. Vaccine viruses can be spread through the gastrointestinal tract (parvovirus vaccine), through the kidneys (CAV-1), and through the respiratory tract (CAV-2). ■

Feline Vaccination Protocol at the Matthew J. Ryan Veterinary Hospital

	Neonates*	Kitten Series		Last Kitten Booster	First Adult Booster	Adult Boosters	
Vaccines	**2-4 weeks**	**6-8 weeks**	**10-12 weeks**	**12-13 weeks**	**15 months**	**Every year**	**Every 3 years**
Feline Viral Rhinotracheitis (FVR)	X	X	X	X	X		X
Panleukopenia (FPV)	X	X	X	X	X		X
Feline Calicivirus	X	X	X	X	X		X
Rabies Virus				X	X	X#	X#
Feline Leukemia (optional)			X	X	X	X	
Feline Immunodef. Virus (optional)		X	X	X	X	X	

FVRCP = Feline Viral Rhinotracheitis – Calici – Panleukopenia

*Give a few drops of the MLV (intranasal vaccine) in each eye and in each nostril as soon as the eyes open. Useful in catteries or during outbreaks in shelters. From 6–8 weeks on either the intranasal or the injectable FVRCP can be used. Do not inject the intranasal vaccine!

#Repeat yearly if a recombinant vaccine is used.